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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

		Application No.	Applicant(s)
Office Action Summary		10/509,554	SEAKINS, PAUL JOHN
		Examiner	Art Unit	
		CHRISTOPHER FINDLEY	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 September 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-39</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-39</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>12/30/2004</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   **Claims 1, 2, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable**

over Bettinardi (US 6731326 B1).

        Re **claim 1**, Bettinardi discloses a low vision viewing apparatus that displays an

image of an object, said apparatus comprising: a camera, including a lens to define an

image plane and an electronic image sensor located at the image plane for capturing a

visual field providing an output set of pixels representative of said visual field depending

on input as to specific pixels or ranges thereof (Bettinardi: Fig. 1, camera 10 and small

aperture optics 12); a display means configured to provide a representation of a window

of interest (Bettinardi: Fig. 1, TV/display 18); an electronic processing means controlled

by a program, connected intermediate of said display means and said camera, which

defines said visual field as a set of pixels and a subset of said set of pixels as said

window-of-interest (Bettinardi: Fig. 1, interface device 20; Figs. 3 and 4, selecting

window of interest; column 6, line 62-column 7, line 8; Fig. 6, which describes the steps

performed by the microprocessor 62 of Fig. 5); and a steering means to select said

subset of pixels on said visual field which constitutes the window-of-interest (Bettinardi:

Fig. 1, zoom and pan control device 28).

Bettinardi does not explicitly disclose that said processing means selectively acquiring said subset of said set of pixels from said camera depending on user input from said steering means and pre-programmed instructions. However, one of ordinary skill in the art at the time of the invention would have found it obvious that any processor would rely on pre-programmed instructions to impart functionality by executing previously written programs/software/operating systems, as is well known in the art.

Re **claim 2**, Bettinardi discloses that said electronic processing means includes storage means (Bettinardi: Fig. 5, RAM coupled to microprocessor 62); and said electronic processing means controlled by said program that causes said processing means to apply digital magnification to said stored set of pixels to a desired magnification level selected by said low-vision user, said electronic processing means displaying a magnified image of said visual field image on said display means (Bettinardi: column 4, line 63-column 5, line 25).

Re **claim 6**, Bettinardi discloses that said electronic image sensor is a low-resolution image sensor that is moved within said image plane of said lens to capture a plurality of low-resolution images, and combining said low-resolution images to create a high-resolution image (Bettinardi: Figs. 3 and 4 illustrate that the selected portion is movable within the captured image plane).

3.   **Claims 3-5, 7-10, 14, 17, 23, 34-36, and 39 are rejected under 35 U.S.C.
103(a) as being unpatentable over Bettinardi (US 6731326 B1) in view of Strong et
al. (US 20020071047 A1, hereinafter referred to as "Strong").**

Re **claim 3**, Bettinardi does not specifically disclose that said electronic image
sensor is a high-resolution image sensor that captures a high-resolution image.
However, Strong discloses a sight enhancement device, wherein pixels may be
interpolated to transform a low resolution image into a high resolution image (Strong:
paragraph [0035], interpolation). Since both Bettinardi and Strong relate to low vision
devices, one of ordinary skill in the art at the time of the invention would have found it
obvious to combine the interpolation processing of Strong with the low vision system of
Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 4**, Bettinardi does not specifically disclose that said electronic image
sensor is a low-resolution image sensor that captures a plurality of low-resolution
images by moving a low-resolution image sensor by sub-pixel amounts and combining
said low-resolution images to create a high-resolution image. However, Strong
discloses a sight enhancement device, wherein pixels may be interpolated to transform
a low resolution image into a high resolution image (Strong: paragraph [0035],
interpolation). Since both Bettinardi and Strong relate to low vision devices, one of
ordinary skill in the art at the time of the invention would have found it obvious to
combine the interpolation processing of Strong with the low vision system of Bettinardi
in order to enhance the signal for displaying a clearer picture.

Re **claim 5**, Bettinardi does not specifically disclose that said electronic image

sensor consists of a plurality of low-resolution image sensors that are optically "butted"

together to create a single high-resolution image sensor and captures a high-resolution

image. However, Strong discloses that the image sensor can be an array or matrix of

CCDs (Strong: paragraph [0020]). Since both Bettinardi and Strong relate to low vision

devices, one of ordinary skill in the art at the time of the invention would have found it

obvious to combine the interpolation processing of Strong with the low vision system of

Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 7**, Bettinardi discloses that said electronic processing means moves

said window-of-interest on said electronic image sensor by reading said subset of pixels

from said electronic image sensor and displaying said window-of-interest on said

display means (Bettinardi: column 7, lines 30-63).

Re **claim 8**, Bettinardi discloses that said electronic processing means moves

said electronic image sensor within said image plane of said lens and displays said

window-of-interest on said display means (Bettinardi: Figs. 3 and 4; column 7, lines 30-

63).

Re **claim 9**, Bettinardi discloses that said electronic processing means moves

said electronic image sensor within said image plane of said lens and displays said high

resolution image on said display means (Bettinardi: column 7, lines 30-63, sub-pixels

are interpolated and displayed).

Re **claim 10**, Bettinardi discloses that said low-vision user controls the location of said window-of-interest or said electronic image sensor by a device selected from the group consisting of a trackball, a joystick, a set of buttons, a mouse, a touch screen, or a touch tablet (Bettinardi: Fig. 1, zoom and pan control device 28; column 5, lines 3-5).

Re **claim 14**, Bettinardi discloses that said program controls said processing means to apply digital magnification to said window-of-interest to a desired magnification level selected by said low-vision user and displays the digitally magnified image on said display means (Bettinardi: column 4, line 63-column 5, line 25).

Re **claim 17**, arguments analogous to those presented for claim 14 are applicable to claim 17. Therefore, claim 17 has been analyzed and rejected with respect to claim 14 above.

Re **claim 23**, Bettinardi does not specifically disclose that said program controls said processing means to automatically adjust the brightness and contrast of said window-of-interest on said display means. However, Strong discloses that the contrast stretching unit 70 facilitates the user to perform a contrast stretch or to make a contrast adjustment to a specific range of brightness or luminance of the signal 43 (Strong: paragraph [0030]). Since both Bettinardi and Strong relate to low vision devices, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the features of Strong with the low vision system of Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 34**, Bettinardi discloses a low vision viewing apparatus that magnifies and displays an image of an object on a display means, said apparatus incorporating a controller for electronically processing said image, said electronic processing modes including: a live video capture and image display of said magnified image (Bettinardi: Fig. 1, TV/display 18). Bettinardi does not specifically disclose a static image capture and image display of said magnified image. However, Strong discloses that the target object image I is located by the lens 40 and captured by the image sensor 42 and the sensor converts the image I into a digital image signal 43, consisting of a series of still frames (Strong: paragraph [0034]). Since both Bettinardi and Strong relate to low vision devices, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the features of Strong with the low vision system of Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 35**, Bettinardi does not specifically disclose that said static image capture mode allows a user to adjust the magnification of said static image on said display means. However, Strong discloses that the device 10 provides real-time image processing, with a variable zoom control to locate and magnify the target object (Strong: paragraph [0017]). Since both Bettinardi and Strong relate to low vision devices, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the features of Strong with the low vision system of Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 36**, Bettinardi discloses that said static image capture mode allows the user to navigate said static image on said display means (Bettinardi: Figs. 8 and 9).

Re **claim 39**, Bettinardi does not explicitly disclose that said static image capture mode analyzes the reading order of said text and allows automatic movement of the section of said static image visible on said display means, using a controller to determine the speed and direction of said automatic movement. However, one of ordinary skill in the art at the time of the invention would have found it obvious that the pan and zoom control would need to keep track of the speed and direction of movement in order to effectively control the path of the camera.

4.   **Claims 11, 15, 18, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bettinardi (US 6731326 B1) in view of Formanek et al. (US 20030014445 A1, hereinafter referred to as "Formanek").**

Re **claim 11**, Bettinardi does not specifically disclose that said electronic processing means subsamples said window-of-interest by reading said subset of pixels as defined by a previously defined regular pattern and displays a compressed image on said display means. However, Formanek discloses that compression technology can be used to compress the bit map data in accordance with standard bit map data compression techniques (Formanek: paragraph [0009]). Since both Bettinardi and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the compression abilities of Formanek with the system of Bettinardi in order to reduce the memory needed to store image files.

Re **claim 15**, arguments analogous to those presented for claim 14 are
applicable to claim 15. Therefore, claim 15 has been analyzed and rejected with
respect to claim 14 above.

Re **claim 18**, arguments analogous to those presented for claim 14 are
applicable to claim 18. Therefore, claim 18 has been analyzed and rejected with
respect to claim 14 above.

Re **claim 33**, Bettinardi does not specifically disclose that said program
automatically moves through said stored high-resolution image text, said movement
based on said reading order of said text on said display means. However, Formanek
illustrates a process for reflowing, where the process is automated (Formanek: Fig. 5).
Since both Bettinardi and Formanek relate to document scanning, one of ordinary skill
in the art at the time of the invention would have found it obvious to combine the
reflowing process of Formanek with the system of Bettinardi in order to make any
document easily viewable (Formanek: paragraph [0008]).

5.   **Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over
Bettinardi (US 6731326 B1) in view of Trulaske et al. (US 5633674 A, hereinafter
referred to as "Trulaske").**

Re **claim 25**, Bettinardi does not specifically disclose that said electronic
processing and storage means successively adjusts the focus of said lens and captures
an image at different focus points, analyzes said different focused images to extract the

image sections of each different focus image which are the sharpest, and combines

said image sections to yield a high-resolution image with extended depth of focus.

However, Trulaske discloses a device for the visually impaired, wherein the reading

device automatically focuses the text (Trulaske: column 2, lines 3-4) and focusing and

zoom controls are provided (Trulaske: column 2, lines 29-31). Since both Bettinardi and

Trulaske relate to devices for the visually impaired, one of ordinary skill in the art at the

time of the invention would have found it obvious to combine the focusing of Trulaske

with the system of Bettinardi in order to provide for greater portability since the

orientation of the components may be varied in a system that includes autofocusing.

6.   **Claims 12, 13, 16, 19-22, 24, 28-32, 37, and 38 are rejected under 35 U.S.C.
103(a) as being unpatentable over Bettinardi (US 6731326 B1) in view of Strong et
al. (US 20020071047 A1) in view of Formanek et al. (US 20030014445 A1).**

        Re **claim 12**, neither Bettinardi nor Strong specifically discloses that said

electronic processing means subsamples said high-resolution image by reading said set

of pixels as defined by a previously defined regular pattern and displays said

compressed image on said display means. However, Formanek discloses that

compression technology can be used to compress the bit map data in accordance with

standard bit map data compression techniques (Formanek: paragraph [0009]). Since

Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in

the art at the time of the invention would have found it obvious to combine the

compression abilities of Formanek with the system of Bettinardi and Strong in order to reduce the memory needed to store image files.

Re **claim 13**, Bettinardi discloses that said program controls said processing means to apply digital magnification to said high-resolution compressed image to a desired magnification level selected by said low-vision user and displays the digitally magnified image on said display means (Bettinardi: column 4, line 63-column 5, line 25).

Re **claim 16**, arguments analogous to those presented for claim 14 are applicable to claim 16. Therefore, claim 16 has been analyzed and rejected with respect to claim 14 above.

Re **claim 19**, neither Bettinardi nor Strong specifically discloses that said program controls said processing means to select said desired magnification level for each letter so that text in said visual field and said window-of-interest is magnified to a preselected size on said display means. However, Formanek discloses processing steps that indicate determining the size of a display and adjusting the words and graphics to fit the display dimensions (Formanek: Fig. 2, steps 210, 212, and 214). Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the reflowing process of Formanek with the system of Bettinardi and Strong in order to make any document easily viewable (Formanek: paragraph [0008]).

Re **claim 20**, arguments analogous to those presented for claim 19 are applicable to claim 20. Therefore, claim 20 has been analyzed and rejected with respect to claim 19 above.

Re **claim 21**, Bettinardi discloses that said digital magnification is implemented using two dimensional scaling by a form of interpolation selected from the group consisting of linear interpolation, nearest-neighbour interpolation, or cubic spline interpolation (Bettinardi: column 6, line 65-column 7, line 1, "The generation of additional pixels can be performed by any desired technique including duplication of neighboring pixels").

Re **claim 22**, Bettinardi does not specifically disclose that said program controls said processing means to automatically adjust the brightness and contrast of said high-resolution compressed image on said display means. However, Strong discloses that the contrast stretching unit 70 facilitates the user to perform a contrast stretch or to make a contrast adjustment to a specific range of brightness or luminance of the signal 43 (Strong: paragraph [0030]). Since both Bettinardi and Strong relate to low vision devices, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the features of Strong with the low vision system of Bettinardi in order to enhance the signal for displaying a clearer picture.

Re **claim 24**, arguments analogous to those presented for claim 22 are applicable to claim 24. Therefore, claim 24 has been analyzed and rejected with respect to claim 22 above.

Re **claim 28**, neither Bettinardi nor Strong specifically discloses that said program controls said processing means to use page segmentation to identify the location of letters and a reading order for said letters in said stored high-resolution text and display said letters on said display means in a predefined pattern. However, Formanek discloses a decomposed image showing text/graphic block positions/ordering (Formanek: Fig. 3b). Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the reflowing process of Formanek with the system of Bettinardi and Strong in order to make any document easily viewable (Formanek: paragraph [0008]).

Re **claim 29**, neither Bettinardi nor Strong specifically discloses that said program controls said processing means to arrange said letters into words and displays said words on said display means in a predetermined sequence wherein each said word replaces the previous said word after a predetermined time period. However, Formanek discloses an arrangement of word positions within a text block (Formanek: Fig. 3c). Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the reflowing process of Formanek with the system of Bettinardi and Strong in order to make any document easily viewable (Formanek: paragraph [0008]).

Re **claim 30**, neither Bettinardi nor Strong specifically discloses that said program controls said processing means to arrange words on said display means in a predetermined sequence, wherein said words are displayed from one side of said display means to the opposite side of said display means. However, Formanek

discloses an arrangement of word positions within a text block (Formanek: Fig. 3c).

Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary

skill in the art at the time of the invention would have found it obvious to combine the

reflowing process of Formanek with the system of Bettinardi and Strong in order to

make any document easily viewable (Formanek: paragraph [0008]).

Re **claim 31**, neither Bettinardi nor Strong specifically discloses that said

program controls said processing means to separate said letters by displaying said

letters with a predetermined space between each said letter. However, Formanek

discloses that resolution is adjusted based on a scaling factor related to point size

(Formanek: Fig. 6, step 610). Since Bettinardi, Strong, and Formanek relate to

document scanning, one of ordinary skill in the art at the time of the invention would

have found it obvious to combine the reflowing process of Formanek with the system of

Bettinardi and Strong in order to make any document easily viewable (Formanek:

paragraph [0008]).

Re **claim 32**, Bettinardi discloses that said program uses a device to determine

the section of said stored high-resolution image text displayed on said display means by

a device from the group consisting of a trackball, a joystick, a set of buttons, a mouse, a

touch screen, or a touch tablet (Bettinardi: column 5, lines 26-41, joystick).

Re **claim 37**, neither Bettinardi nor Strong specifically discloses that said static

image capture mode analyzes text present in said static image and provides for the

display of said text on said display means in a plurality of predetermined formats.

However, Formanek discloses providing a method for reflowing a document image based on knowledge of the positions of the various graphical elements within the document using universal format and display techniques that allow the document to retain the look of its original font and graphical elements, as well as reflow the document within the target display width (Formanek: paragraphs [0008] and [0009]). Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the reflowing process of Formanek with the system of Bettinardi and Strong in order to make any document easily viewable (Formanek: paragraph [0008]).

Re **claim 38**, neither Bettinardi nor Strong specifically discloses that said static image capture mode analyzes the reading order of said text, and facilitates the user to navigate around said static image on said display means by using a controller to determine the section of said static image to be displayed on said display means. However, Formanek discloses that text is extracted from the original document image as shown in step 402 on a word by word basis in the sequential order in which the words appear in the original document image 400 (Formanek: paragraph [0034]). Since Bettinardi, Strong, and Formanek relate to document scanning, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the reflowing process of Formanek with the system of Bettinardi and Strong in order to make any document easily viewable (Formanek: paragraph [0008]).

7.   **Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable**

over Bettinardi (US 6731326 B1) in view of Strong et al. (US 20020071047 A1) in

view of Horyu (US 4972501 A).

Re **claim 26**, neither Bettinardi nor Strong specifically discloses that said

program controls said processing means to implement pixel level binarisation on said

stored high-resolution image based on a uniform pixel threshold level. However, Horyu

discloses an image processing apparatus, wherein a binarizing circuit to binarize the

digital information stored in the memory 141 using the boundary value from the

boundary value determiner 144 as a reference (Horyu: Fig. 4, binarizing circuit 145;

column 5, lines 16-19). Since Bettinardi, Strong, and Horyu relate to image processing,

one of ordinary skill in the art at the time of the invention would have found it obvious to

combine the binarizaton of Horyu with the system of Bettinardi and Strong in order to

enable the graphic read-out information to provide a pattern converting apparatus which

can always automatically operate at the optimum operating point (Horyu: column 3,

lines 44-48).

Re **claim 27**, arguments analogous to those presented for claim 26 are

applicable to claim 27. Therefore, claim 27 has been analyzed and rejected with

respect to claim 26 above.

Contact

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is

(571)270-1199. The examiner can normally be reached on Monday-Friday (8:30 AM-
5:00 PM).

     If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Marsha D. Banks-Harold can be reached on 571-272-7905. The fax phone
number for the organization where this application or proceeding is assigned is 571-
273-8300.

     Information regarding the status of an application may be obtained from the
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/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621

/Christopher Findley/